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Solvation Structure and Dynamics of Room-temperature Ionic Liquids

Raluca Musat[1], Robert A. Crowell[1], Dmitriy Polyanskiy[1], Andrew Cook[1], James Wishart[1], Marie Thomas[1], Yuelin Li[2], and Dohn Arms[2]

[1]Department of Chemistry, Brookhaven National Laboratory, P.O. Box 5000 Upton, NY, 11973
[2]Advanced Photon Source, Argonne National Laboratory, Argonne, IL 60439

Room-temperature ionic liquids have emerged as a new class of solvents that have several potential applications due to their unique properties (e.g., low volatility, large electrochemical window, high conductivity, etc.). One of their more exciting possibilities is their potential use in nuclear fuel reprocessing for the next generation of nuclear reactors. The selectivity of a given imidazolium ionic liquid depends strongly on the choice of the counter anion. In this contribution we will present new results using both static and time-resolved extended x-ray absorption fine structure (approx. 1-ns resolution) on a series of bromide-containing imidazolium salts. The static results provide detailed information of the solvation shell of the bromide ion and the time-resolved data shed light on the nature and chemical behavior of the lowest lying charge transfer band.